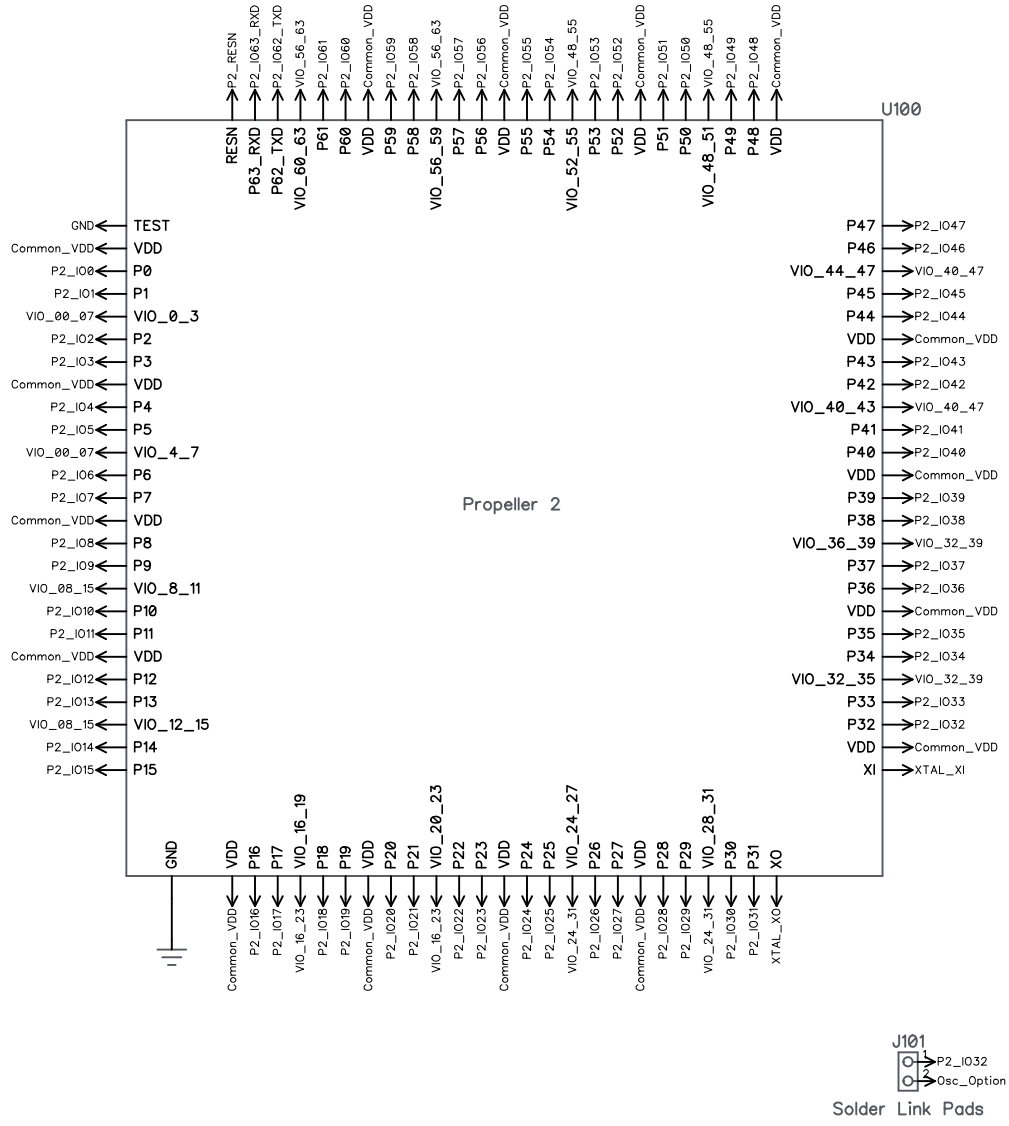
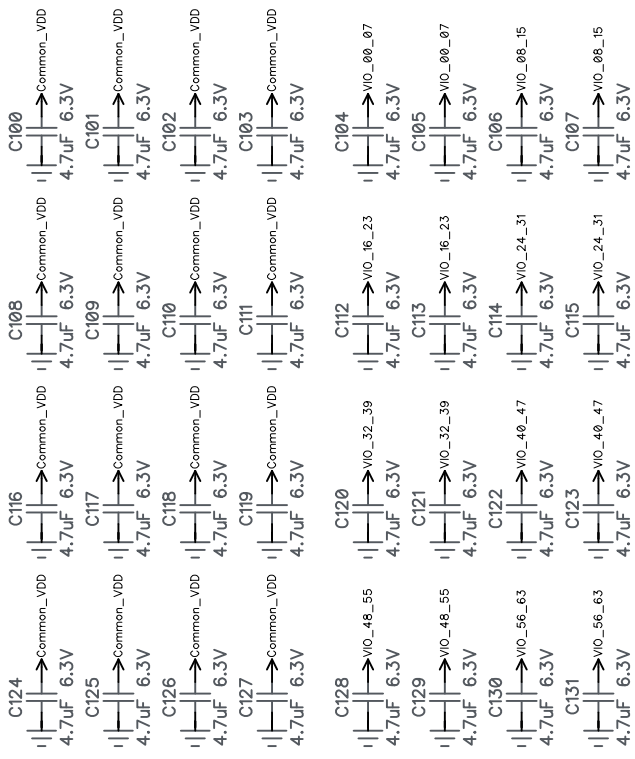


Microcontroller

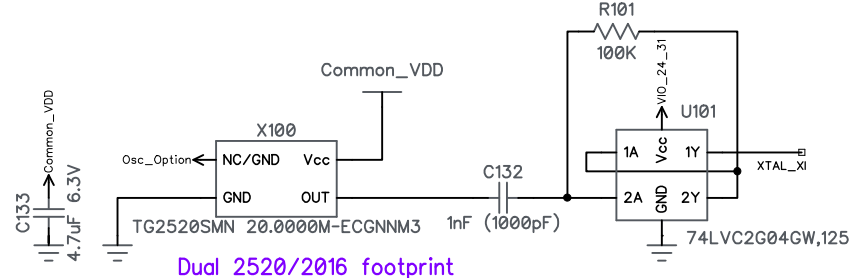


Propeller 2

VDD and VIO local decoupling



Oscillator Circuit



Dual 2520/2016 footprint

Parallax Inc.
599 Menlo Drive
Rocklin, CA 95765

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<http://www.parallax.com/>

Propeller 2 Edge Module with 32MB RAM

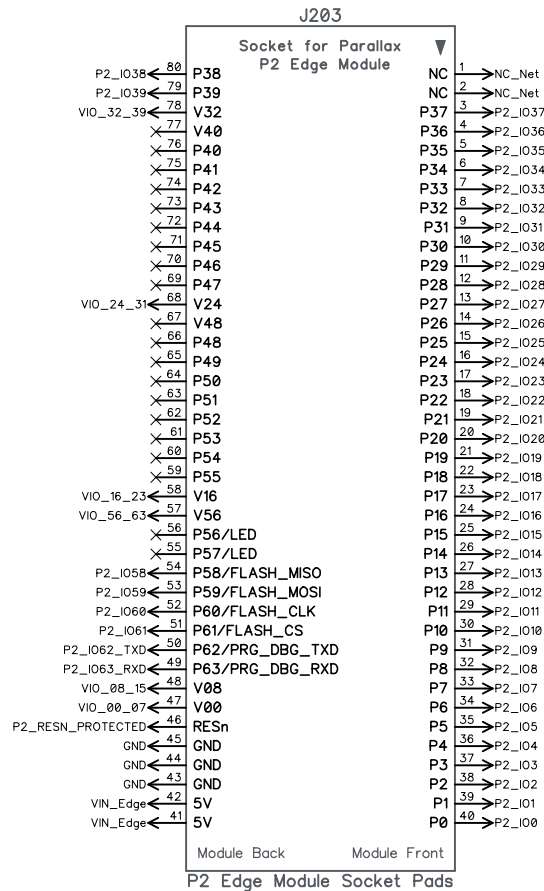
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Part Number: P2-EC32MB
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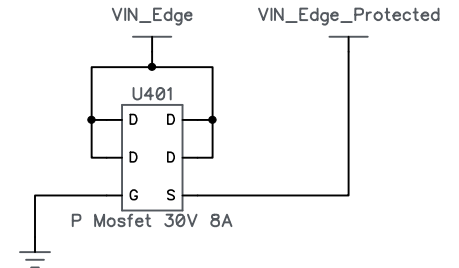
Last Update: 29 Mar 2022 (MM)

Module Edge Pads and Protection

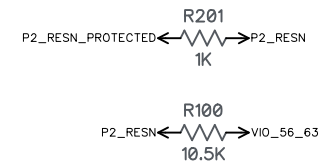
P2 Edge Module, Card Edge Pads (80 way, 1.27mm pitch)



Reverse Polarity Protection



Reset Pin Protection & Pull-up



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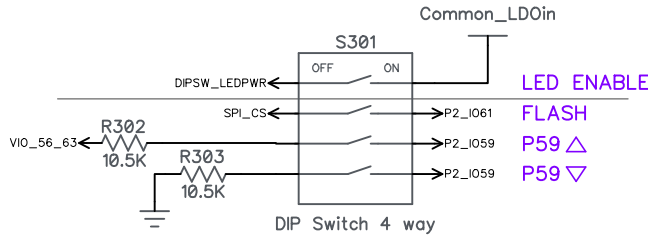
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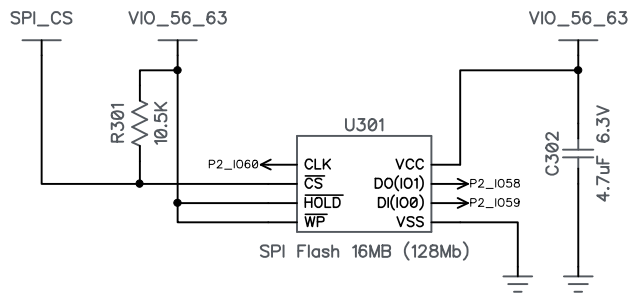
Last Update: 29 Mar 2022 (MM)

Memory

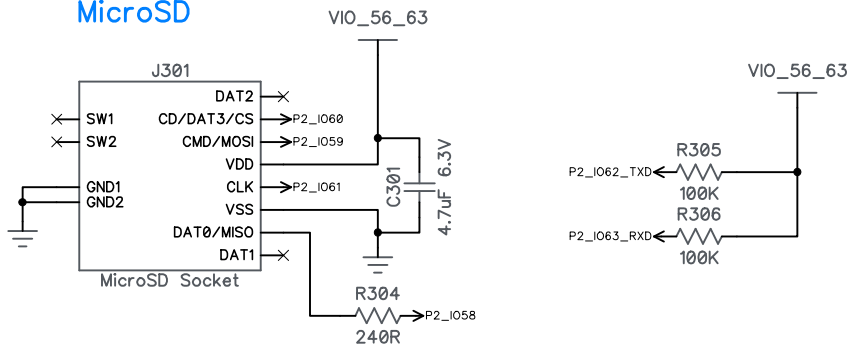
Boot options and onboard LEDs enable switch



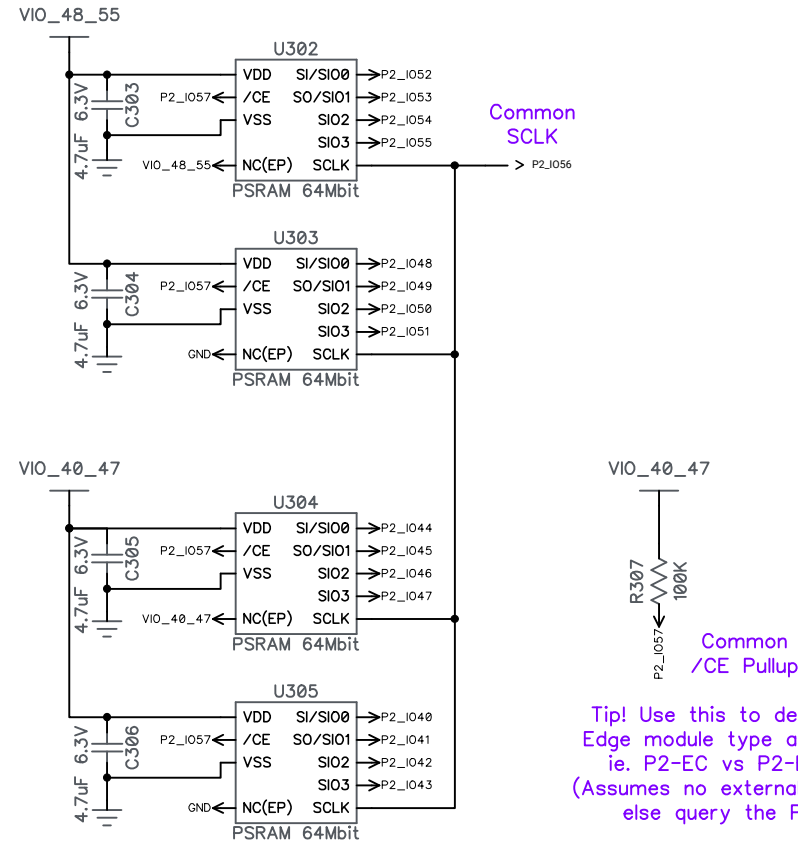
SPI Flash



MicroSD



32MB PSRAM, 16 Bit Bus



Tip! Use this to detect the Edge module type at boot-up. ie. P2-EC vs P2-EC32MB. (Assumes no external product- else query the PSRAM)

Note: The PSRAM's NC(EP) pads are not connected inside the PSRAM. The EP pad helps alignment of the part during manufacturing and in this layout EP is connected either to VIO or VSS to simplify routing.

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Propeller 2 Edge Module with 32MB RAM

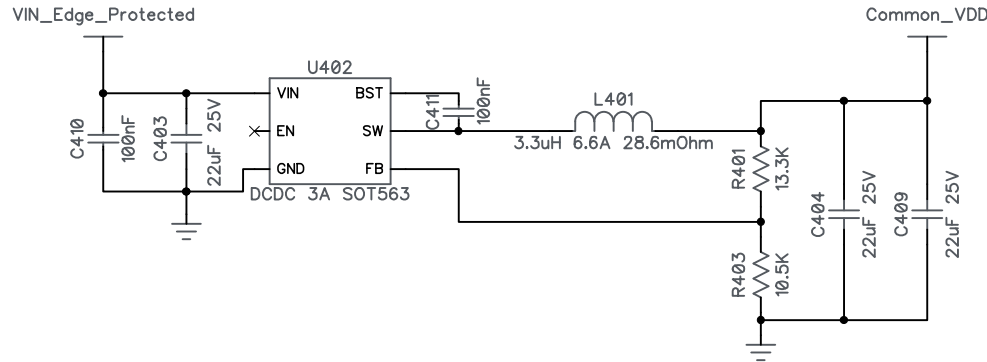
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Revision: B

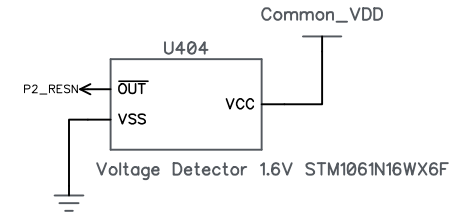
Last Update: 29 Mar 2022 (MM)

Power

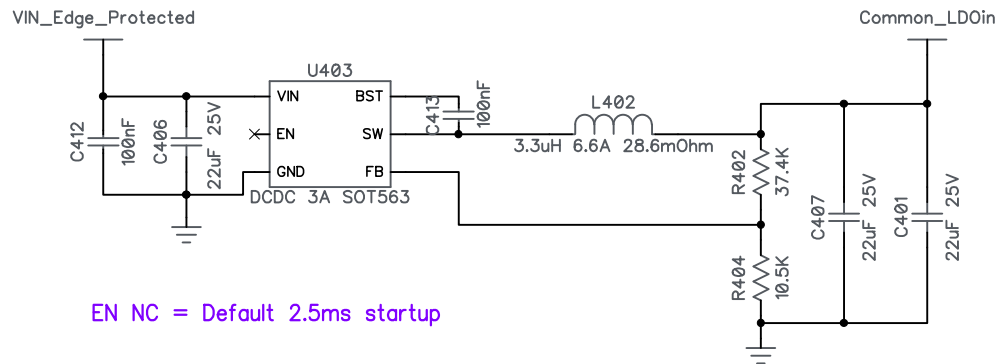
VDD Power Supply - Nominal 1.8V



Brownout Detector



LDO Power Supply - Nominal 3.65V



EN NC = Default 2.5ms startup

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Propeller 2 Edge Module with 32MB RAM

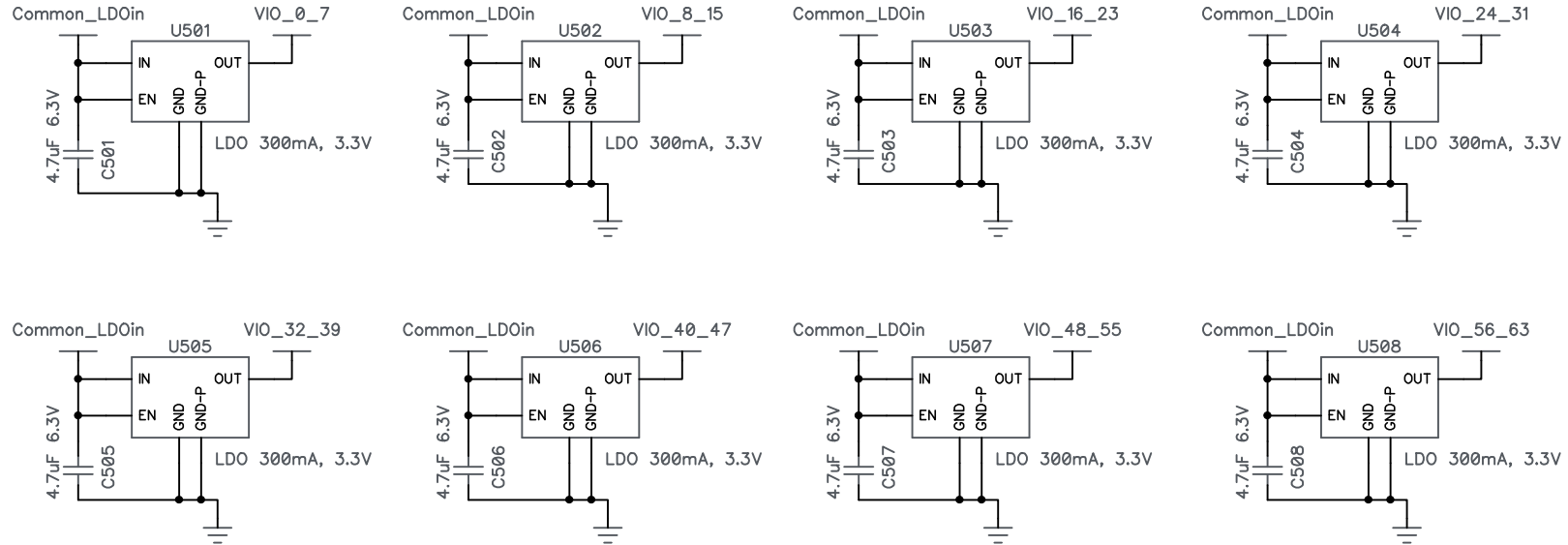
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LDO 3V3

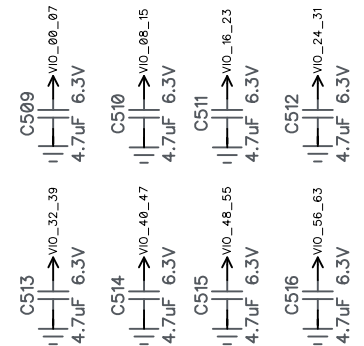
Low noise VIO 3.3V local regulation



These power sources ensure a fixed 3.3V low noise supply for each group of eight P2 smart pins.

A single high-current regulator could be used, but this design has some advantages, including:

- Less boardspace and lower part cost
- Thermal footprint spread over significantly larger area of copper
- Regulates directly to the power pins, removing power-path losses
- No requirement for local beads/caps for analog experiments, eliminates filtering losses
- Groups of IO's isolated from power supply cross-interference
- Limits power pin issues in each group from impacting others, including undervoltage, overvoltage and short-circuit protection



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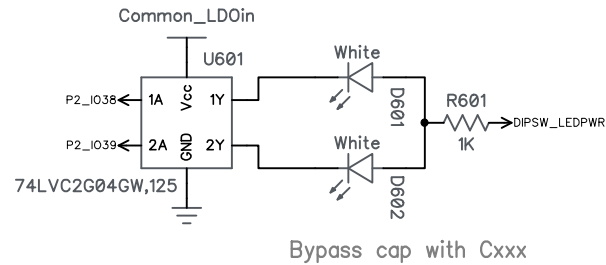
Propeller 2 Edge Module with 32MB RAM

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LEDs



The LED's are wired such that they turn ON when the corresponding P2_IO pin asserts high.

LED's and buffer powered from LDO VIN rail (approx. 3.8V) :

- keeps switching current off the VIO rail
- positive going threshold : Typical 2V
- negative going threshold : Typical 0.8V

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Propeller 2 Edge Module with 32MB RAM

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For reference: Boot Memory and Boot Serial (programming) pins

Boot Memory	P61 (output)	P60 (output)	P59 (output)	P58 (input)
SPI flash	CSn	CLK	DI	DO
SD card	CLK	CSn	DI	DO

Boot Serial	P63 (input)	P62 (output)
Serial	RX	TX

Boot Mode Selection	FLASH	P59 \triangle	P59 ∇
Serial window of 60 seconds, default. (When SD card is NOT inserted)	OFF	OFF	OFF
Serial window of 60 seconds, overrides SPI Flash and SD card.	ON or OFF	ON	OFF
Serial window of 100 ms, then SPI flash. If SPI flash fails then serial window of 60 seconds.	ON	OFF	OFF
SPI flash only (fast boot), no serial window. If SPI flash fails then shutdown.	ON	OFF	ON
SD card with serial window on failure. If SD card fails then serial window of 60 seconds.	OFF	OFF	OFF
SD card only, no serial window. If SD card fails then shutdown.	OFF	OFF	ON

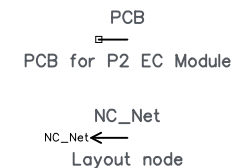
Mounting holes



Mounting hole diameter 3mm

Orientation hole diameter 2.6mm

BOM only - mfg



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Revision: B

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BOM

RefDes	Quantity	Name	Manufacturer
C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C133, C301, C302, C303, C304, C305, C306, C501, C502, C503, C504, C505, C506, C507, C508, C509, C510, C511, C512, C513, C514, C515, C516	55	200-01049 : CAP-CER,4.7uF,X5R,6.3V,0402	TDK : C1005X5R0J475M050BC
C132	1	213-01014 : CAP-CER,1000pF,10%,16V,0402	Samsung : CL05B102K05NNNC
C401, C403, C404, C406, C407, C409	6	200-11542 : CAP CER 22UF 25V X5R 0805	Samsung : CL21A226MAQNNNE
C410, C411, C412, C413	4	200-11500 : CAP-CER,0.1UF,100V,X5R,0402	Murata : GRM155R62A104ME14D
D601, D602	2	350-10034 : LED WHITE CLEAR 0603 R/A	Inolux : IN-S63AS5UW
J101	1	Solder Link Pads	
J203	1	Edge Socket Pads	
J301	1	452-10033 : CON-MICRO SD,RA,SMT,LP	Molex : 473092651
J701, J702	2	Empty	Empty
L401, L402	2	275-03366 : IND,3.3uH,6.6A,28.6mOHM	Pulse : PA5430.332NLT
NC_Net	1	Empty	
PCB	1	300-64002 : Raw PCB P2-EC32MB Module	
R100, R301, R302, R303, R403, R404	6	172-10220 : Res,10.5k,1%,0402	Panasonic : ERJ-2RK1052X
R101, R305, R306, R307	4	150-11052 : Res,100k,0402	Yageo : RC0402JR-07100KL
R201, R601	2	173-10002 : RES,1K,5%,0402	Stackpole : RMCF0402JT1K00
R304	1	150-12023 : RES,240,5%,0402	Yageo : RC0402JR-07240RL
R401	1	173-10001 : RES,13.3K,1%,0402	Stackpole : RMCF0402FT13K3
R402	1	150-10374 : RES,37.4K,1%,0402	Stackpole : RMCF0402FT37K4
S301	1	400-10100 : Slide Switch SPST DIP 4-way 1.27mm SMT	CTS Electro : 218-4LPSTJR
U100	1	P2X8C4M64P : P2X8C4M64P P2 multicore uC	Parallax : P2X8C4M64P
U101, U601	2	603-10039 : IC-INV,DUAL,74LVC2G04GW,SOT-23-6	NXP : 74LVC2G04GW,125
U301	1	604-10047 : IC FLASH 128M SPI 133MHZ 8SOIC	Winbond : W25Q128JVSIM TR
U302, U303, U304, U305	4	604-10048 : PSRAM,64Mb,QSPI 133/84MHz,RBX,USON8	AP Memory : APS6404L-3SQR-ZR
U401	1	500-10038 : MOSFET P-CH,30V,8A,TSOP6	Vishay : SI3417DV-T1-GE3
U402, U403	2	601-10353 : IC-REG,3A,SOT-563,AP62301Z6	Diodes Inc : AP62301Z6-7
U404	1	601-10292 : IC VOLT DETECTOR 1.6V LP SOT-23	STMicro : STM1061N16WX6F
U501, U502, U503, U504, U505, U506, U507, U508	8	601-10339 : IC REG LDO CMOS 3.3V UDFN4	OnSemi : NCP114AMX330TCG
X100	1	252-10006 : Oscillator,20MHz,500ppb,TCXO,1.8V,2520	EPSON : TG2520SMN 20.0000M-ECGNM3

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Propeller 2 Edge Module with 32MB RAM

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